National EPA-Tribal Science Council (TSC) Fall 2012 Meeting

Tulalip Tribes of Washington Administration Building
6406 Marine Drive
Tulalip, WA 98271

December 4 – 6, 2012

MEETING SUMMARY

Tuesday, December 4, 2012: Traditional Ecological Knowledge (TEK) Training Day

Theme: Coordination of TEK and Living Resources

Welcome and Invocation With Traditional Song

Melvin R. Sheldon, Jr., Chairman, Tulalip Tribes Board of Directors; Ray Fryberg, Executive Director of Cultural and Natural Resources, Tulalip Tribes; Sheryl Fryberg, Executive Director of Health and Human Services, Tulalip Tribes; and Patti Gobin, Director of Special Projects, Tulalip Tribes

Bear Carrillo called the meeting to order at 9:25 a.m. Jeff Mears introduced Katie Tiger as the new TSC Tribal Co-Chair, and Ted Coopwood introduced Brenda Groskinsky as the new TSC EPA Co-Chair. Bear introduced Mel Sheldon, who welcomed the TSC members and guests on behalf of the Tulalip Tribes. The reservation consists of 22,000 acres, established by an 1855 treaty. Tribes in the Pacific Northwest work together, as they have common interests. The journey has not been easy, particularly when tribal governments are not recognized as sovereign governments. The work that the TSC is doing is a testament to the acknowledgment of tribes as sovereign nations. He was honored by the presence of the TSC members, who are working on an important agenda.

The Tulalip Tribes are fortunate to have resort and casino revenue, which is reinvested in the community. Tulalip youth receive 80 to 100 percent funding for their college journeys; the tribe is proud to invest in its future leaders. Although the Tulalip are flourishing as a whole, some members have problems, so the tribe has established programs to assist its members. Although the Tulalip enjoy success, the challenges are many. He finished by noting that the TSC works to improve the environment, and all regions are interconnected to each other and Indian country.

Ray Fryberg stated that his grandmother always said, "Take only what you need, and leave the rest." Each generation borrows the earth from its children; it does not inherit the earth from its ancestors. The tribe sued the government for fishing rights in the 1970s and as a result was given the right to protect its environment. The tribe has co-management authority for the watershed that feeds into the system that produces salmon. "Co-management," however, does not always mean "cooperative management." The tribal members are the last vanguards of the environment. Restoration is not enough; protection needs enforcement. The tribe is trying to do its best for the environment, and Ray applauds the work of the TSC as it tries to make a difference. The Creator guides the way, including thoughts, words and actions, and he wished for a productive meeting for the TSC.

Mel, Ray, Sheryl Fryberg and Patti Gobin performed a traditional Tulalip prayer song.

Patti G. explained that traditional tribal names are based on the environment. Her traditional name was passed down from her great-great grandmother. Despite the attempt of the U.S. government to re-educate the tribes in boarding schools, her Tulalip ancestors passed down their lifeways. An EPA-tribal partnership is very important to continue the lifeways, ensuring that they are safe. Her grandchildren and on to the seventh generation will benefit from such a partnership. Sheryl shared a story from her

grandmother about the berries found in the woods. If each person performs one small act to improve the environment, then the environment will improve. She thanked the TSC for the good work that it performs.

Meeting Overview
Bear Carrillo, DBC Consulting

Bear asked each of the TSC members and guests to introduce themselves and then provided an overview of the agenda for the meeting. It has taken the TSC a long time to reach the point that it has, and each meeting must be used to continue to establish trust because working together requires trust. Listening to each other provides insight into where the person is coming from, who he or she is, and his or her history and ideas. Understanding these factors is important to understand a person's agenda.

Jim Woods, EPA Region 10 Senior Tribal Policy Advisor and member of the Makah Nation, welcomed the meeting participants to the Pacific Northwest, where the tribes have embraced the message of sustainability and preservation of cultural resources. It is an honor to host the TSC and allow the local tribes to present information on traditional ecological knowledge (TEK) and tell their stories. Their techniques and messages can be applied throughout the country. The Boldt decision, which resulted in co-management of resources, is unique in the Pacific Northwest, although it does not always mean "cooperative management" as Ray pointed out. There are different aspects of TEK, but when historical and cultural knowledge are incorporated with modern science, and then it is necessary to take the next step, including air and water monitoring and identification of pollutants and other environmental issues. As the tribes build capacity, they are able to identify sources of pollution. The Pacific Northwest is data rich, but the next step needs to be taken. States do not always take tribal data into consideration. How can the tribes ensure that other governments utilize tribal data? TEK is greater than stories; it is about health, people, the environment, treaty rights and so forth.

Indigenous Health Individuals: A Method (Based on Coast Salish Communities' Definitions of Health) to Evaluate the Health of a Tribal Community in Relation to the Health of Its Natural Resources
Larry Campbell, Sr., Tribal Historic Preservation Officer, Swinomish Indian Tribal Community; and Jamie Donatuto, Environmental Specialist, Swinomish Indian Tribal Community

Larry Campbell explained that the Coast Salish tribes possess rich natural resources, and fish are an important part of the tribes' identities and affect public health. Marine resources are spiritual, and the spirit demands that tribal people eat the fish and shellfish, even if they are toxic. The health indicators that the Swinomish Indian Tribal Community has developed can be shared with neighboring tribes, which can use their own languages to personalize the indicators for their uses. Scientists from academia and the government should work with tribal scientists during the scoping process to reduce competing and duplicate science. The tribes want to be part of the solution.

Jamie Donatuto mentioned the parallel boat and canoe analogy, which must be applied as government and tribal scientists work together. All factors of tribal health must be considered in addition to physiological health. Community-based health indicators can be used so that the tribes are an equal, parallel part of the risk assessment process. Polling can provide important information on a community without divulging proprietary information. The researchers began the project because seafood is a cultural keystone species, vital to all aspects of Swinomish life, and the current source-exposure-dose-effects continuum considers only physiological aspects of health. Alternative approaches for defining health are needed that include the spiritual, cultural and social (gathering) aspects that the Swinomish find important to overall health. Eating seafood feeds the Swinomish soul, and it is important to nourish the soul. Originally, the researchers identified four major health indicators in defining and assessing health in relation to seafood; this has been expanded to six which are: natural resources security, cultural traditions, education, community connection, self determination and well-being.

To assess how the Swinomish view cultural, spiritual and mental aspects of tribal health, the researchers conducted a series of polls, which allowed the participants to provide anonymous and honest answers. The polls used software that allowed real-time answers, which sparked discussion among the participants. The poll results can be used to establish a baseline of the health of the community, track health trends over time, determine priorities for cleanups, establish environmental standards, and for emergency preparedness planning. Because the health indicators could not be assumed to be equally important to each person or community, the polls allowed the participants and communities to rate the health indicators; each community surveyed tended to rank the health indicators differently. It also is important to determine the context of the poll results.

The next steps for the project are to continue to test and refine the health indicators within Coast Salish communities and partner with tribes across the United States so that the health indicators are reflective of tribal values. Although there will need to be some modifications, the overarching themes of education, cultural traditions, self determination, natural resources security, community connection and well-being tend to be important to all tribal communities. With each iteration of the health indicators, it is important to allow tribal leaders to review and approve them before any of the information is used. The ultimate goal is that these health indicators can be used to more accurately evaluate examine tribal health for a variety of decision-making purposes.

Larry explained that the process of gathering the seafood is as important as eating it; it provides a connection between tribal elders and youth. Pollution must be decreased to protect this important lifeway. Industry says that it is following permitting limits, but the pollution still is too high. The country must be held to a higher standard. Connections must be made to allow tribal communities to use their own teachings to evaluate tribal health and the aspects that are important to them.

Adam Baumgart-Getz commented that these indicators are measurements of sustainability and resilience but not necessarily of public health. Larry said that culture is the main contributor to community health. If the information is being gathered in a culturally appropriate manner, then it speaks to tribal health. Tribes can revisit the results and examine their own cultures and traditions. Adam asked for clarification that the indicators measured community health as a whole rather than individual community members. Larry responded that community begins and ends with families.

Joe Schubauer-Berigan asked whether the researchers asked the questions in different ways to determine that they were asking the right questions. Jamie responded that the researchers ask questions in different ways with overlap that allows them to examine the issues from many perspectives. Larry added that he worked with Jamie regarding how the tribes communicate.

Ted asked whether the health indicators would be expanded. His work is related to how children are protected from harmful contaminants. If the elders and children are protected, typically the general public is protected as well. Jamie explained that the health indicators have undergone many iterations, and the current six are the basic, overarching themes. Each of the categories has subcomponents that can be modified for different communities, including children, elders, women of child-bearing age and so forth. To protect the most vulnerable, all aspects, including spiritual, are considered.

Dana Sarff said that the spiritual value is important, and it is necessary to reconnect with environmental and tribal origins. John Mosley added that it is important to underscore spirituality in the holistic framework of TEK. He asked what approaches the researchers used to examine the spiritual health of the community. Larry replied that the spirit comes from the land, and the tribal members must pay respect as a community and as individuals to the resources. Jamie explained that each community defined spirituality differently, and some people did not want to discuss it because of the sacredness of the topic. Different tribes each held a different focus.

David Charters spoke about prioritization, noting that some tribes may not be willing to set external priorities. It might be interesting to determine whether the responses change when people are polled about real rather than hypothetical situations. There may be a difference between internal tribal priorities versus priorities for EPA. Larry said that the community needs to prioritize as a whole, and his project provides an internal opportunity to prioritize.

Sustaining Treaty Fishery Resources and Habitat in the Columbia River Basin
Paul Lumley, Director, Columbia River Intertribal Fish Commission (CRITFC); and Aja DeCoteau, Watershed Department Manager, CRITFC

Paul Lumley explained that natural resources are central to tribal culture, and the "first foods" and how they are ordered (e.g., water, salmon, game, roots, berries) are how Indians describe themselves as people. Songs, prayers and creation stories are based on first foods. In an 1855 treaty, the Yakama Nation reserved its rights to first foods, and in the 1960s and 1970s, federal marshals were ordered to arrest state game wardens who were beating tribal people for exercising their treaty rights. Since the time of the treaty, salmon in the Columbia River have declined from 17 million to 1.75 million as a result of habitat degradation and overharvesting. The treaty language has helped local tribes with their efforts to restore the salmon population.

The CRITFC was established in 1977 to ensure a unified voice in the overall management of fishery resources and, as managers, to protect reserved treaty rights through the exercise of the inherent sovereign powers of the tribes. Although located primarily in Portland, Oregon, the commission operates a major genetics laboratory in Idaho, and its Enforcement Department is located in Hood River, Oregon. The ceded land of the four tribes represented by the CRITFC represents more than 25 percent of the Columbia Basin. The basin reaches into seven states and Canada and includes almost all of the salmon habitat above the Bonneville Dam. Salmon from the basin reach as far north as Alaska and as far south as Mexico. As a result of several dams in the basin, large sections of the river are blocked to salmon, and a coalition has been formed to restore these areas as salmon habitat.

Major places of trading and cultural exchange, such as Celilo Falls and Kettle Falls, have disappeared as a result of dams. Contaminated sediment and dust from dramatic reservoir level changes cause health problems. Loss of salmon in the Upper Snake River in Idaho had negative impacts on wildlife and ecosystem functions. Tribes are working to control their own destinies through efforts to restore the salmon and lost ecosystems. One of the tribe's restoration plans is the only plan with numeric objectives for full recovery. There are 15 tribes with management authorities and responsibilities affected by the Columbia River Treaty; these tribes, which used to fight each other, formed a coalition to work with 29 First Nations in Canada. Tribal lifestyles are not relics of the past.

Aja DeCoteau provided a timeline of the CRITFC's efforts, which began in 1994 when a fish consumption survey performed with EPA, resulted in a 2011 Future of Our Salmon Conference, and most recently culminated in a toxic reduction strategic planning session with EPA and the Upper Columbia United Tribes. The fish consumption survey led to the finding that tribal members generally consume six to 11 times the national average. A follow-up contamination survey sampled 298 fish tissues from 26 locations and found 92 different contaminants. The Future of Our Salmon Conference was attended by more than 250 tribal leaders, federal and state fisheries managers, scientists, nontribal fishers and members of the public who are concerned that salmon recovery is challenged by toxic contamination in the Columbia River. The strategic planning session, held in June 2012, resulted in short-, intermediate- and long-term recommendations, such as enhancing existing effective programs, supporting Toxic Substances Control Act (TSCA) reform and fully funding the Columbia River Restoration Act.

A recent U.S. Geological Survey (USGS) report, prepared in partnership with the CRITFC and Lower Columbia Estuary Partnership, found that flame retardants and steroids were consistently detected in

wastewater treatment plant effluents. Of the 14 pharmaceuticals analyzed, all but two were detected in at least one city. Estrogenicity levels measured in the study were found to be well above levels that have been shown to cause effects in aquatic biota, and detections for several pesticides and polychlorinated biphenyls in stormwater from some sites exceeded chronic freshwater quality criteria.

Oregon was successful in passing water quality standards that use the highest fish consumption rate in the United States; the CRITFC fish consumption survey was used to support this decision. The Washington State Department of Ecology *Fish Consumption Rate Technical Support Document*, published in September 2011, strongly considered and recommended a tribal-based fish consumption rate, but as a result of political pressure, the state revised the document and no longer recommends a tribal-based fish consumption rate. EPA did not approve Idaho's proposed fish consumption rate, stating that it was not protective of the population. The Affiliated Tribes of Northwest Indians has requested that EPA take steps to establish a federal default fish consumption rate of no less than 175 grams per day for the states of Oregon, Washington and Idaho based on scientific surveys of Pacific Northwest native populations. The next step is to coordinate the 15-tribe coalition in the Columbia Basin to address regional water quality issues. Tribal elders have stated, "If we take care of the salmon, the salmon will take care of us."

Beth Jackson asked whether, in terms of TSCA reform, the group was using European efforts as an example. Aja responded that the CRITFC supports current EPA reforms, which include a precautionary principle. It is necessary to reverse the current U.S. approach and examine toxics before they enter water systems.

Lee Juan Tyler explained that his tribe used incubation systems to restore fish numbers and noted the interconnectedness of water systems and rivers. Unique basins could re-establish salmon runs. His tribe is working to bring healing back to the land and water.

Ray Colby asked whether state water quality standards or surveys included sport fishery fish consumption. Aja responded that the CRITFC surveys focused solely on tribal consumption. States have various studies for different groups of stakeholders. EPA is mandated to examine all applicable data to ensure that standards are protective of the entire population. Lon Kissinger added that the tribal survey is the most thorough and comprehensive and is considered the "gold standard" for environmental regulations in Puget Sound and the Columbia River Basin. The tribes' proactiveness helps the federal government to protect them. Recreational surveys are not adequate for regulatory decisions.

Tom Baugh asked whether technological solutions had helped with the recent rise in fish populations. Can technology help reach fish levels that existed 150 years ago? Paul answered that the change is a result of allowing water to move more freely, and hatcheries also have helped increase the number. The recent increases have been seen at tribal locations. To allow the salmon levels to return to 1855 levels, it will be necessary to remove the dams. If the salmon can get past two of the dams, a significant amount of the habitat will be open to them again. Tom asked whether there were plans to remove or remediate the two dams. Paul responded that the coalition and Canadian First Nations are working to restore salmon passage, and the affected U.S. states seem amenable to the effort. The best approach may be a federal-state coalition. Bill Thompson remarked that the most difficult component of the dam removal effort that he was involved with was finding collaborators. Sports fisherman are strong allies. The effort required listening, learning the language of the various participants and patience.

In response to a question from Felicia Wright, Paul explained that the 15 tribes, led by their tribal governments, had discussed water quality and realized that the tribes must speak in unison. Fish consumption rates and water quality standards have been added to the platform but not in relationship to the Columbia River treaty. Lee Juan noted that tribes need to ensure that their voices are heard to ensure justice and truth. It is necessary to learn from the past.

Traditional Knowledge and Modern Science
Ray Colby, Water Quality Specialist, Makah Nation; and Dana Sarff, Sustainable Resources Manager, Makah Nation

Dana said that many tribal members instinctively know what TEK is, but it is necessary to put it into understandable language. Wikipedia provides an inclusive definition of TEK as well as a definition of modern science that is similar. The questions of modern science were derived from TEK, and modern science arrived at conclusions. World views of Old World people (European Americans) and New World people (Native Americans) are different at their core. The Old World, which generally lives in an unbalanced relationship with nature, views the environment as a resource that can produce economic wealth, whereas the New World has a balanced relationship with nature and lives within its framework. European and Native Americans also have different beliefs in terms of social systems, culture and government. The worlds and views often collide, and traditional knowledge often is embedded within a community and guarded.

Similarities between TEK and modern science include observation, collection of information over time, analysis and interpretation of observations, arrival at possible conclusions, testing of conclusions and sharing of information. The differences are that TEK does not require formal education or accreditation, and the TEK process is oral rather than written. Acceptance of TEK within modern science is a challenge. The historic, traditional world view of the environment by Native America lends itself to working within the laws of nature and ecological boundaries. This paradigm naturally leads to a traditional, ecosystem-based approach to protecting natural resources. TEK is place-based, so it generally is different for each tribe. For example, the historically strategic location of the Makah Nation serves as a sentinel site for regional and national environmental monitoring.

Ray explained that the Makah are the "people who live by the rocks and seagulls." Historically, the Makah were a seafaring people, dependant on gathering shellfish, fishing, sealing and whaling. Currently, 50 to 60 percent of the tribal economy depends on tribal commercial fishing. Tribal members also rely on seafood for noncommercial cultural and subsistence use. The Makah Nation is based on kinships and clans, and the tribe moved seasonally depending on the availability of resources. Makah traditions and ceremonies, which include 1,500 years of whaling traditions, continue to be handed down from generation to generation without being reduced in the process. Sharing cultural and spiritual meaning is important and the basis of Makah oral tradition.

Current tribal projects incorporate cultural and ceremonial insight, and the tribe's traditional science manifested itself in a sustainable existence through management, growth and attainment. Available tribal knowledge is incorporated, and tribal capacity is built by retaining tribal culture. Examples of contemporary engagement includes efforts to protect Makah treaty rights (e.g., exceptions to EPA Region 10 Federal Air Rules for Reservations to preserve open beach fires, smokehouses, traditional food preparation and sweat lodges) and establishment of tribal fish consumption rates. During the 2012 First Stewards Symposium: Coastal Peoples Address Climate Change, tribal members examined the impact of climate change on indigenous coastal cultures. Makah fish management is ecosystem-based, and attention to details and minute chemistry will help restore fish levels. The tribal programs for water quality, air quality, land quality and solid waste, and environmental health all fall within the Makah Fisheries Management Department. Current studies within the Environmental Management Division performed by students will help the tribe to find the best ecosystem-based management strategies; providing funding at the student-level has been beneficial to the tribe.

Dana emphasized that the Makah environmental programs are holistic, and all of the departments and divisions communicate with each other. The tribe is building capacity in terms of air quality monitoring because air quality affects water quality. Air pollution from China affects the mercury levels of Pacific

Northwest lakes. The Makah Nation also has land clean-up programs that focus on prior U.S. Department of Defense sites. Environmental, human and economic health are interconnected with fisheries and environmental management, treaty-protected natural resources, tribal sovereignty, government-to-government consultation and the air/water/land interface. The goal is to protect treaty rights and sovereignty, protect habitat, develop protective policies, successfully manage natural resources, and incorporate TEK and modern science into ecosystems-based fisheries management. The acid rain and mercury deposition cycles each affect the water and other resources of the Makah Nation. TEK can form a framework and a base from which or within which modern science can proceed. TEK also can help pose the questions on which hypotheses are formed for testing.

Jim noted that air and water quality affect resources, so standards are being structured toward resources and public health. The Makah Nation now is place-based and cannot migrate with the fish. Some Makah fisherman can navigate using only the stars, but the Makah people also are engaging in cutting-edge science to make management decisions that do not deplete the available resources. Data are used to protect the Makah resources. It is necessary to think about strategies to use data to take the next step.

John asked whether the state had updated its standards based on Makah data. Jim responded that the Makah Nation standards were approved in 2004 or 2005, and Washington has not made revisions to its water quality standards since then. The Makah Nation is the largest treaty fish consumer in the United States and supports a significant increase in the national standards.

State of the Environment in the Puget Sound Region of the Pacific Northwest: A Cultural Perspective
Daryl Williams, Environmental Liaison, Tulalip Tribes

Daryl Williams noted that the natural environment affects every aspect of Native American life, including spiritual practices and traditional foods, medicine, clothes and artwork. The current state of the environment is not healthy, with species disappearing or too toxic to eat or handle; spiritual sites are being lost to development. Native Americans want to be one with nature as they go through life. People must better manage the environment if they want to continue to eat fish. Daryl displayed a series of pictures that illustrate why the environment is so important. The Northwest Indian Fisheries Commission and its 20-member treaty tribes created the *2012 State of Our Watersheds Report*, which covers all of the 20 major watersheds in Puget Sound as well as the three coastal watersheds. The report finds that habitat is being lost as a result of development faster than it is being restored.

Puget Sound is the second-largest estuary in the United States and supports two-thirds of Washington State's population. More than one-third of the land is in private ownership, one-third is in federal ownership, one-quarter is state owned, and the remaining land is owned by local governments and tribes. Within the area, there are 17 treaty tribes and two federally recognized nontreaty tribes. Since the treaty was signed, an estimated 70 percent of estuarine wetlands, 50 percent of riparian habitat and 90 percent of old-growth forest have been lost. Washington exempts wells from permitting for demands of 5,000 gallons per day or less. As the population grows, so does the demand for water, which reduces the base stream flows for fish. Most tribal hunting, fishing and gathering is conducted on federal and state land, and these lands are becoming increasingly important to tribes. It is necessary to find a "middle ground" and manage lands in a manner appropriate to support people and other species. Approximately one-half of the culverts that have been installed do not allow fish to pass, and one-quarter have not been inspected and might not allow fish to pass. It has been against state law to block fish passage for more than 100 years, so the state is breaking its own law. The matter will be considered by a federal court.

Dana noted that the *2012 State of Our Watersheds Report* was part of a white paper sent to Washington, D.C.

John asked how EPA has worked with the state in terms of permitting. Lon said that Region 10 is quite active in terms of water quality standards. EPA initially disapproved Oregon's fish consumption rates, resulting in the tribal rates that now are in effect, and disapproved Idaho's rates. Region 10 is helping Washington to examine its *Fish Consumption Rate Technical Support Document*, but Lon was unsure about EPA's role in the culvert decisions. EPA also is helping with state cleanup, using the Suquamish fish consumption rate for one effort. Region 10 has active partnerships with the tribes. Daryl added that EPA did not have the authority to deal with culverts. Felicia said that EPA has jurisdiction over stormwater, and stormwater from forest roads affects culverts. EPA is examining best management practices and regulatory approaches to address stormwater from forest roads and will initiate tribal consultation regarding this issue. This is a very complex jurisdictional issue. Daryl noted that homeowners are attempting to fix their personal culverts to allow fish passage.

John commented that Nevada does not follow some EPA permitting rules and does not perform tribal consultation. The state has permitted on tribal lands on which it has no jurisdiction.

Lee Juan noted that his tribe has water treaty rights, but the water is toxic from underground plumes and causes cancer and other diseases. There are 17 potential Superfund sites in his area. EPA does not always have the authority to help. It is necessary to limit the power of states and corporations. Daryl added that EPA used Tulalip standards for the cleanup of a Superfund site.

Caucus Sessions

The Tribal and EPA Caucuses met separately to continue planning for the June 2013 TEK Workshop. Both Caucuses provided a report of their discussions on Day 3 of the meeting.

Instructions for Day 2 Field Trip and Meeting

The participants were provided instructions regarding the transportation to the Tulalip Tribes Hibulb Cultural Center and Natural History Preserve the following morning. Bear recessed the meeting at 4:51 p.m.

Wednesday, December 5, 2012: Tour and TEK Training

Tour of the Tulalip Tribes Hibulb Cultural Center and Natural History Preserve

The participants toured the Tulalip Tribes Hibulb Cultural Center and Natural History Preserve, learning the history of the People of the Salmon and the decades-long process to realize the cultural center, which opened in August 2011. The participants met with tribal elders Hank Gobin, Cultural Resource Manager, and Wayne Williams, who told stories about the tribe and the longhouse portion of the cultural center. The tribal members sang traditional Tulalip blessing songs. The participants enjoyed a "Rediscovery" lunch of traditional Tulalip foods, such as barbecued salmon, hibulb bread, camas and traditional teas, prepared by the tribal members. The TSC members agreed that it was a once-in-a-lifetime experience and thanked the Tulalip tribal members for their extraordinary hospitality.

Culture, Law, Risk and Governance: The Ecology of Traditional Knowledge in Climate Change Adaptation
Preston Hardison, Policy Analyst, Office of Treaty Rights, Tulalip Tribes

Preston Hardison provided an overview about the current status of legal protections for TEK, which traditionally has not been recognized as a source of reliable knowledge nor been incorporated into resource management decision making. Some government agencies and scientists, however, have reversed their opinions on the validity of TEK during the past 30 years. TEK now is being requested but

without an understanding of cultural and legal issues. Outsiders do not understand the spirituality of the TEK and that it must be treated properly. Although some tribes have created research guidelines and some agencies have created codes of ethics and guidelines, these good intentions have failed to resolve deep legal conflicts that occur once TEK is shared.

Western laws, such as intellectual property rights and the Freedom of Information Act (FOIA), must be considered. The United Nations Declaration on Indigenous Peoples, which includes provisions regarding free, prior and informed consent (FPIC), allows the tribes to approve or reject proposed actions that may affect them or their lands. Although tribes must be informed of all relevant benefits, costs and risks of such projects, they should be careful about sharing TEK that they do not want in the public domain.

Preston provided the participants with "TEK/Information Flow Model" and "Risk/Spirituality Matrix" diagrams. He recommended that the Agency consider the legal aspects and protect TEK to facilitate sharing. Tribes should develop guidelines regarding how to protect their TEK and establish a process to give or deny consent. Both groups should consider alternate methods to exchange knowledge and negotiate outcomes that allow tribes to manage their resources. The government must ensure that there are no adverse outcomes. Knowledge is a resource, and the U.S. government must change its understanding to acknowledge this.

In response to a personal experience that Bob conveyed about the sharing of tribal knowledge, Preston explained that even though information can be "fuzzed," there is software available that allows people to "unfuzz" the data.

Libby Nelson, Tulalip Tribes Environmental Policy Analyst, noted that there is an opportunity to bring tribes together to discuss TEK. Previously, discussions were driven by federal and other entities. Strategy discussions now are tribally driven. To increase tribal involvement, it is necessary to allow the tribes to share their data to the degree that they want and within governmental context (e.g., National Environmental Policy Act).

Bill liked the idea of negotiating outcomes, and tribes should be engaged in such dialogue. TEK is a connection to the land, which is very difficult to separate. The sum of TEK is greater than the whole of its parts. Tribes need to protect their identities and give their "seal of approval," which is based on trust.

Preston noted that there are issues with publicly funded research. TEK protection must be considered when tribes perform publicly funded TEK research. Such research should require the incorporation of FPIC.

Beth asked whether the tribes were investigating FOIA issues. Preston said that Canadian First Nations have knowledge protection in place in their country, but he was unaware of FOIA efforts by U.S. tribes. Tribes have requested tribal consultation in terms of domestic rights to protect traditional cultural practices (e.g., song, dance, art).

Lee Juan noted that the White House Tribal Nations Summit 2012 was occurring that day in Washington, D.C. He added that individual households possess traditional knowledge, and there are many different levels of knowledge that can be shared.

Patti G. added that when EPA engages in discussions with the tribes, it must understand the tribes' points of view because they are sovereign nations.

Caucus Sessions

The Tribal and EPA Caucuses met separately to continue planning for the June 2013 TEK Workshop. Both Caucuses provided a report of their discussions on Day 3 of the meeting.

Thursday, December 6, 2012

Bear provided an overview of the revised agenda, and Patti G. described the Tulalip Tribes origin as the Salmon People before performing a blessing song from the Tulalip Salmon Ceremony.

Research Collaborations and Communication Between Tribal and Regional Scientists
Bruce Duncan, Regional Science Liaison (RSL), EPA Region 10

Bruce Duncan explained that connections among scientists from EPA regions and the Office of Research and Development (ORD) have been made. The job of the RSLs is to be aware of the needs of the regions and broker ORD science to meet those needs. Tribes should use RSLs to connect to EPA science. Bruce provided details about his background, noting that decisions are made with or without science, and his passion and drive is to bring science to decision making. The RSLs speak with each other weekly and provide a rich scientific network.

In response to a question from Ken Bailey, Bruce explained that cross-connections among RSLs can help tribes in all regions. He urged tribes to leverage the knowledge available from the RSLs. Felicia asked how the RSLs work with tribal EPA staff, such as Regional Indian Program Coordinators. Bruce responded that it is the responsibility of the RSLs to ensure that such coordination occurs, and RSLs can be an additional channel that the tribes can use to approach the Agency in terms of their science needs. What can EPA do to bring better science to the critical decisions that tribes are considering?

Bill commented that RSLs appear to be a great resource, noting the different and unifying themes that occur among the various regions regarding TEK. Bruce said that although he began as RSL only a few months earlier, he found TEK to be an interesting topic for discussion. The North Pacific Landscape Conservation Cooperative (LCC) has funded seven grants regarding climate change and TEK issues. EPA must learn how to incorporate TEK into its science and decision making. Each RSL is the sum of his or her individual knowledge and experience, and there is a great deal of variety among the RSLs, making the network a great resource.

Denise Jensen asked how well and in what ways the Agency uses tribal data. Tribes are producing a great deal of good data; are the data being used in EPA decision making? Bruce was unsure but promised to explore this issue. Bob said that the Tribal-Focused Environmental Risk and Sustainability (Tribal-FERST) tool uses tribal data. Using the data for decision making is less challenging than using data for enforcement. Beth added that tribes participate in the Environmental Information Exchange Network (Exchange Network), which is the primary method to provide the Agency with electronic data. The tribes can determine which data they will send and which will remain in-house. The data may be used for internal tribal decision making. The National Tribal Caucus is interested in being able to access and use tribal environmental data provided to EPA so that it can globally view and search data geographically and by tribe. The Office of Environmental Information is working on tribal queries; using data that are already publicly available. Beth offered to share more information about the effort when it becomes official.

Felicia remarked that tribal data in the system are important so that decisions are not made based solely on nontribal data. Her office is examining discrete tribal data sets (e.g., drinking water). There is a lack of compliance in Indian country, so the Agency is determining how it can work with the tribes. The goal is to determine the state of the environment in Indian country. National program guidances track tribal data, which will help to determine how tribes are maintaining water quality.

John stated that tribal aquatic biology data are being used by Nevada to update the state's water quality standards in a peer-to-peer collaboration.

Jeff said that tribes need to be educated about the Exchange Network. He noted that a new grant requirement states that tribes must collaborate, which violates the government-to-government relationship between EPA and tribes. Regarding the efforts to determine the state of the environment in Indian country, there is no one "Indian country" because all tribes are different. A state of the environment assessment should be done for each tribe, which would honor the government-to-government relationship. He was interested in seeing a "menu" of EPA science that is available to tribes. Bruce said that modeling efforts are underway, and when there is more information, these models can be shared with states and tribes. RSLs can provide specific examples of how science has been used to inform decisions in their regions. RSLs have regional methods to provide funding, and tribes can discuss their issues with the regions to determine whether they are good candidates for Regional Applied Research Effort (RARE) funding.

Bill asked where to obtain information about the RSLs. Tom explained that four RSLs serve on the TSC: Bob, Region 1; Tom, Region 4; Brenda, Region 7; and Patti Tyler, Region 8. More information can be found at http://www.epa.gov/osp/regions/rslmap.htm. Tom added that each region manages its RARE program differently, so it is important to speak to the RSL. For example, Region 4 uses an internal competition among its divisions; a tribe would not directly submit a project to the region. Work may be performed via a work assignment on an existing contract or via an interagency agreement. Patti T. added that she had sent information on all of the RARE projects to the TSC members via email. If there is an interest in learning about any or all of the projects, she can arrange a presentation. Some RARE projects are applicable nationally (e.g., Region 8 tribal housing sustainability project). Information can be shared to help answer tribal science questions. Bruce encouraged the tribes to contact their regional RSLs with their science questions.

Mike noted that he is working on integrating climate change and TEK into tribal plans, and several EPA webpages (e.g., annual temperature and precipitation anomalies) need to be updated. Bruce said that he could contact the appropriate staff to update the pages. Brenda again urged the tribal TSC members to contact their RSLs with their science questions.

Multidam Removal and Penobscot River Restoration
Bill Thompson, TSC Region 1 Tribal Representative, Penobscot Indian Nation

Bill explained that the Penobscot River is the holiest place for the Penobscot Indian Nation. The source of the river is Mount Katahdin. The Penobscot River Watershed occupies one-third of Maine's area, and air and water deposition of pollutants in the watershed become condensed in the Penobscot River. Until the various dams were built, the river displayed different seasonal flows. Dams, water pollution and overfishing have virtually eliminated sea-run fish in the Penobscot River above Bangor, Maine. One affected species, alewives, can transport clams that provide significant cleanup in the river.

It took 8 years of dialogue among the stakeholders to provide a clear picture of what each of the stakeholders required and to understand each other's language. The organizations worked together to remove the Veazie and Great Works dams, install an experimental bypass channel at Howland, improve fish passage at four existing dams, add power to six existing dams and address community impacts. The expected outcomes include the restoration of 11 sea-run fish species to 1,000 miles of the river and maintenance of 100 percent hydropower resources. Bill provided "before" (current) and simulated "after" pictures of several of the proposed projects. The fish bypass at Howland is a state-of-the-art bypass that is more river like and will allow the fish to pass without sustaining as much physical damage as they do with the current structure. The company completing the bypass will continue to monitor it to ensure that it is successful; if it is not, the dam will be removed by 2019.

Multiple energy strategies will be employed in two phases, and many of the dams will have increased power to compensate for the removed dams. The Great Works Dam was removed in June 2012 following a dam removal ceremony. The Penobscot Chief stated, "Our Identity as a tribe is deeply intertwined with the health of the river. The river's restoration is critical to our cultural survival." The experience taught Bill the importance of perseverance and identifying collaborators who will support desired outcomes.

Lee Juan asked about the size of the reservation and the origin of the river salmon. Bill responded that the original reservation spanned from the White Mountains to New Brunswick; the current reservation includes the islands within the Penobscot River. The tribe has been purchasing its land back and has 100,000 acres of trust lands. The salmon is genetically unique to the river (and has a unique flavor), but the species travels to the coast. He added that he would like to see mercury deposition included in fish tissue studies of the salmon.

Bruce congratulated the collaborators for removing the first dam within 12 years of beginning of the effort; the Elwha Dam took 20 years to remove. He asked how the sediment was evaluated. Bill responded that evaluation occurred via Environmental Impact Statements. Because mercury had entered the sediment from a leak, the sediment was a concern. It also is the main route for foresting, and Bangor was the logging capital of the world at one point.

Jeff said that he was part of two dam removal projects in 2012; it took seven years of planning, and two hours to remove the dams. He congratulated Bill on his groups' success. Bill reiterated that it is important to persevere.

Discussion of TSC Overview Document

The TSC members discussed the previous revisions made to the document by the TSC. Kristen LeBaron recorded the new revisions directly into the document that included the previous tracked changes made by the Caucuses. During lunch following the discussion, the TSC members received a demonstration of the Tribal-FERST tool by Marc Weber of EPA's Western Ecology Division within the Office of Research and Development's National Health and Environmental Effects Research Laboratory.

Recognition of Outgoing Chairs

Fred explained that he was excited about the work of the TSC, which is a reflection of its leadership and the participation of the members. It has been inspirational to attend the meeting, and he has many ideas he will bring back to Headquarters, taking advantage of the energy and positive spirit that has resulted from the meeting. He noted that Jeff and Ted's leadership during the prior two years facilitated openness and balance. The two, despite their different backgrounds, share many qualities, such as dedication, passion and commitment to the TSC. As a result of their leadership, the National Tribal Science Priorities (TSPs) have been embraced by Administrator Lisa Jackson. Fred was impressed by Jeff's openness and desire to make the TSC the best it could be. He thanked Jeff for all of his accomplishments during his tenure as TSC Tribal Co-Chair. Fred commended Ted for "working the system" on behalf of the TSC. He built trust within EPA, promoted TSC activities, met with Office of International and Tribal Affairs staff and ensured that senior EPA leadership was onboard. Fred thanked Ted for leading the charge within the Agency. The TSC still needs Jeff and Ted's insight, honesty and strong opinions as the Council moves forward. Fred presented Jeff and Ted with certificates of appreciation.

Tribal and EPA Caucus Report Outs and Discussion

Tribal Caucus Report Out

Mike Durglo said that it was an honor to serve as the new TSC Tribal Co-Chair as Katie needed to delay her chairship temporarily. He will try to fill Jeff's shoes, but he will need help in doing so. He asked to be held accountable as leader. He reported that the Tribal Caucus had decided that it would meet via teleconference at 3 p.m. Eastern Time Thursday prior to each monthly TSC conference call.

The TEK Workshop will be held in Syracuse, New York, June 18–20, 2013. The Onondaga Nation will serve as host, and the State University of New York College of Environmental Science and Forestry (commonly known as SUNY-ESF) and its Center for Native Peoples in the Environment will provide classroom and meeting space. Presentations at the workshop must focus on methodology and tools rather than theory and definitions. The tentative agenda is as follows:

- Day 1: TEK and Climate Change Presentations
  - Approximately two of each; focus on both TSPs
  - Case studies of science-based TEK and climate change efforts
  - Presentations vetted via a Call for Papers
- Day 2: Field-Trip and Hands-On Activities
  - First wood fuel-heated dormitory, invasive species effect on basket-making, food crops
- Day 3: TSC Business Meeting

The potential outcomes of the TEK Workshop are to: (1) provide an understanding of how TEK is implemented scientifically throughout Indian country and how tribes are using legally defensible science in regard to climate change, (2) articulate tribal priorities so that EPA can implement them in the Agency's budget and other processes, and (3) identify tools that EPA regions can share with their tribes. Potential invitees include EPA senior leadership, including the EPA Administrator Jackson, National Tribal Operations Committee members, and EPA Regional Administrators and Science Liaisons. Bill, Jeff, Katie, Mike and Neil volunteered to serve on the Agenda Development Team for the Workshop, and the Tribal Air Monitoring Support TEK Subcommittee also has indicated that it would like to help with the planning.

Monica asked for volunteers from the EPA Caucus to serve on the Agenda Development Team. Brenda, Patti T., Adam, Tom, Beth and Blake Huff volunteered; Bear will facilitate.

Mike encouraged all of the Tribal Caucus members to attend the Tribal Caucus teleconferences to discuss pertinent business and allow the work to move forward. Bear asked the Tribal Caucus members to ensure that an alternate could attend the call in their absence. The effort will need as many voices as possible to be successful. Katie explained that she had been looking forward to acting as Tribal Co-Chair, but with her current personal and professional situations, asking Mike to step forward was the best option for the Tribal Caucus currently.

EPA Caucus Report Out

Brenda reported that the EPA Caucus was excited about the opportunity to receive TEK training. Although there was some concern that perhaps the planning would not be ready by June 2013, the members agreed that it was necessary to move forward. Some of the members, particularly those representing EPA regions, expressed concerns about travel budgets; some regions do not even have the funding to perform their regulatory role. Virtual participation will be explored, such as videoconferencing, which allows participants to see each other. Training is necessary so that the EPA

representatives can perform their jobs better. The decision by the Tribal Caucus members to focus on science and methodology fits in with the EPA Caucus members' expectations for the workshop.

Several federal agencies have expressed an interest in attending the TEK Workshop. The USGS Northwest Climate Science Center Director is willing to collaborate with the TSC and act as a conduit to the remainder of the USGS science centers. Each science center employs five to six scientists who could attend. It will be necessary to determine how to incorporate a federal presence that is not unmanageable.

In terms of internal business, the EPA Caucus discussed developing an accomplishments report to present to EPA management. This report could be issued annually and serve to not only keep senior management informed but to more broadly communicate our activities to tribes at national meetings and internally to new members that join the Council. If the Tribal Caucus is interested in contributing, the members certainly are welcome. Bill said that he would be interested in reviewing any documents that the EPA Caucus produced. Beth said that it is a good idea to create a document that reflects what the TSC has accomplished. It is important to communicate rather than just report. Bill has software that automatically displays accomplishments; it also tabulates and assigns action items to ensure forward motion on projects. Bear thought that a newsletter following each meeting with bullet points of highlights and action items could be beneficial, and Monica supported this idea. Brenda said that she looks forward to the next 2 years of TSC accomplishments.

Lessons Learned From the Meeting and How They Can Be Applied to the 2013 TEK Workshop

The TSC members brainstormed their vision of what the TEK Workshop would encompass. The first day of the workshop will include TEK and climate change presentations. Potential presenters include: Chris Lee, Melinda Ronca-Battista, Margaret Hiza Redsteer, Kim Greenwood, Dan Wildcat, Seth Moore, Roger Pulwarty, North Pacific LCC grantees, Northwestern Interior Forest LCC, other Alaskan LCCs, Northeastern tribes, Oren Lyons, Henry Lickers, Dan Costa and/or Greg Cajete. Potential topics include: Ojibwe wild rice TEK, how tribes and EPA can interact and/or an example of how EPA has incorporated TEK into its work. The focus of the presentations should be on science, methodology and implementation; presentations will be chosen via a Call for Papers. One day of the workshop (either day 2 or 3) will be devoted to an interactive field trip that includes hands-on training. The remaining day will be filled with TEK and climate change presentations.

John volunteered to chair the TEK Workshop Planning Committee, which includes Genevieve, Joe, Mike, Adam and Felicia. The space available at the host site ultimately will determine the number of attendees, but the TSC members thought that a maximum of 60 to 70 attendees, including 30 TSC members, would be reasonable. Katie will contact Neil regarding the host site and determine his availability to meet with the workshop planners. The Call for Papers and other invitations will manage expectations, explaining that the workshop is a training vehicle rather than a conference. Those not chosen to present will be invited to provide information for handouts. Dignitaries will be provided time to speak during lunch.

The tentative timeline for the Call for Presentations is as follows:

- Prior to the December 2012 Tribal Caucus teleconference, John will create a draft Call for Papers based on the one written for the 2010 National Tribal Science Forum.

- The Tribal Caucus will review and finalize the Call for Presentations during its teleconference on December 13, 2012.

- The TSC will review and finalize the Call for Papers via email by the beginning of January 2013.

- The Call for Presentations will close on February 8, 2013.

Mike wished the TSC members safe travels, and Brenda thanked the members for their participation, noting that there is a great deal of work ahead of them. Mike presented the Tulalip Tribes representatives with a token of the TSC's appreciation for their wonderful hospitality.

Bear adjourned the meeting at 4:07 p.m.

TSC Action Items

- ✧ Katie will contact Neil regarding hosting the TEK Workshop and determine his availability to speak to the TEK Workshop planners as soon as possible.
- ✧ Monica will send John the template used for the 2010 National Tribal Science Forum Call for Presentations.
- ✧ John will draft the TEK Workshop Call for Presentations prior to the Tribal Caucus call on December 13, 2012.